



Letter to the Editor

Meta-analysis on facemask use in community settings to prevent respiratory infection transmission shows no effect


Dear editor,

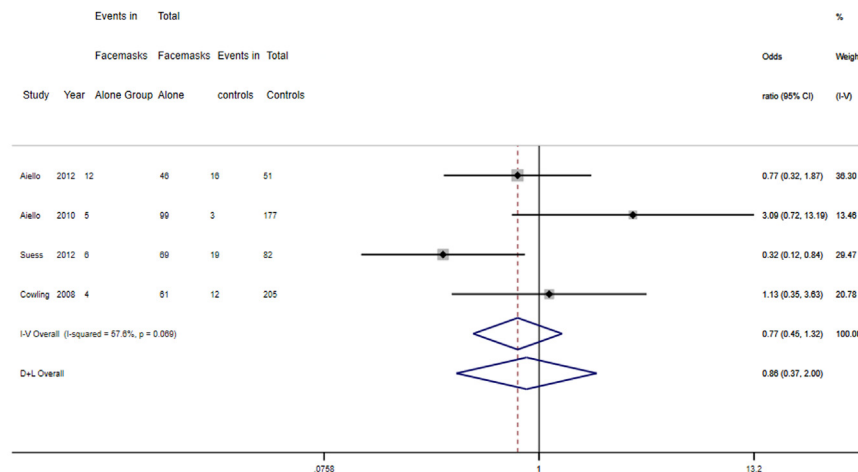
We read with interest the systematic review and meta-analysis by *Chaabna et al.* aiming at synthesizing the available evidence on the effectiveness of facemasks to prevent the transmission of respiratory infections in the community setting (*Chaabna et al., 2020*). The authors reported an apparent benefit of facemasks use, which showed a significant reduction in the risk of influenza, influenza-like illness, severe acute respiratory syndrome coronavirus (SARS-CoV), and SARS-CoV-2 transmission (pooled OR = 0.66, 95% confidence interval: 0.54–0.81). However, there are several methodological flaws in the study that might have led to misleading conclusions. In the meta-analyses on facemasks and influenza outcomes, the authors first meta-analyzed both clinical trials and case-control/retrospective observational studies, with the last studies overestimating the effect. Second, *Chaabna et al.* included five studies that did not have only face mask use as an intervention but were additionally introducing other interventions such as hand hygiene in the same group (*Aiello et al., 2012; Aiello et al., 2010; Cowling et al., 2009; Simmerman et al., 2011; Suess et al., 2012*), a condition that limits the attribution of any observed effect to the use of facemask only. Therefore, their conclusion, "there is enough evidence that medical facemasks are effective in community settings to prevent transmission of respiratory viral infections," is not supported by their analyses (*Chaabna et al., 2020*).

Based on the ten clinical trials included in the meta-analysis, we reviewed and reanalyzed the data to compare whether the use of facemask as a sole intervention was associated with the transmission of respiratory infections in the community setting. From the ten RCTs included in *Chaabna et al.*'s study, five compared

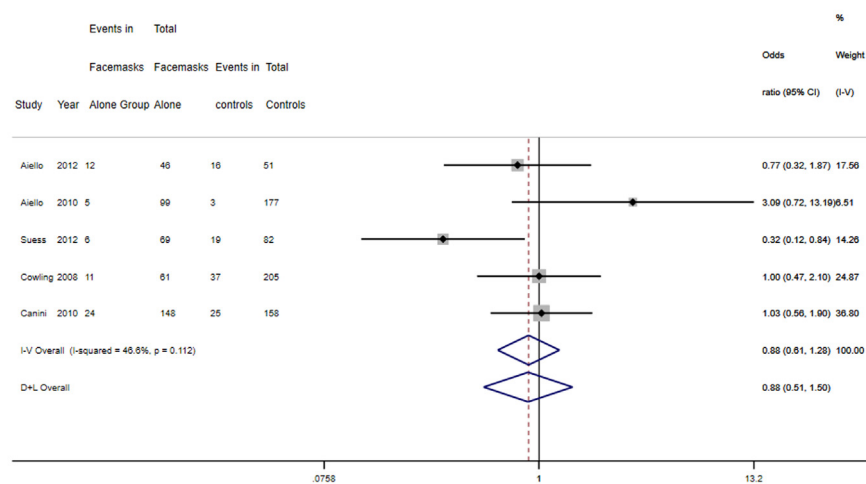
facemasks use alone versus a control group, while three studies compared medical facemasks use alone with the combined intervention of face mask and handwashing (*Aiello et al., 2012; Aiello et al., 2010; Cowling et al., 2009; Simmerman et al., 2011; Suess et al., 2012*). As observed in *Figure 1*, there were no significant differences between medical facemasks use only and controls in the odds of developing laboratory-confirmed influenza and influenza-like illness. Similarly, no differences in laboratory-confirmed influenza risk were observed when comparing mask use solely versus the combined intervention of face mask and handwashing, indicating that facemask as the sole intervention in the community is not associated with reducing respiratory infection. Given the studies used medical masks, cloth masks' efficacy is expected to be even lower; a randomized cluster trial showed that respiratory infection is higher among health care personnel using cloth masks than using medical masks (*MacIntyre et al., 2015*).

Several systematic reviews and meta-analyses suggest a potential benefit of facemasks in viral respiratory infections; however, most of them include mostly non-randomized studies, RCTs with serious methodological issues, and studies mainly derived from the health care setting (*Chu et al., 2020; Liang et al., 2020*). On the other hand, the systematic review and meta-analysis of *Saunders-Hastings et al.* observed a significant protective effect of regular hand hygiene regarding 2009 pandemic influenza transmission risk (OR = 0.62; 95% CI 0.52–0.73; and $I^2 = 0\%$), finding no benefit with facemask use (OR = 0.53; 95% CI 0.16–1.71; and $I^2 = 48\%$) (*Saunders-Hastings et al., 2017*). Because of these divergent results and the lack of high-quality research in this area, strong recommendations for facemask use in the community context should be issued with caution until new evidence is available to show their effectiveness. This is even more important, considering that several studies showed that mask use is associated with headache incidence and worsening of preexisting headache (*Lim et al., 2006; Rebmann et al., 2013; Szeinuk et al., 2000; Radonovich, 2009; Shenal et al., 2011*).

A.



B.



C.

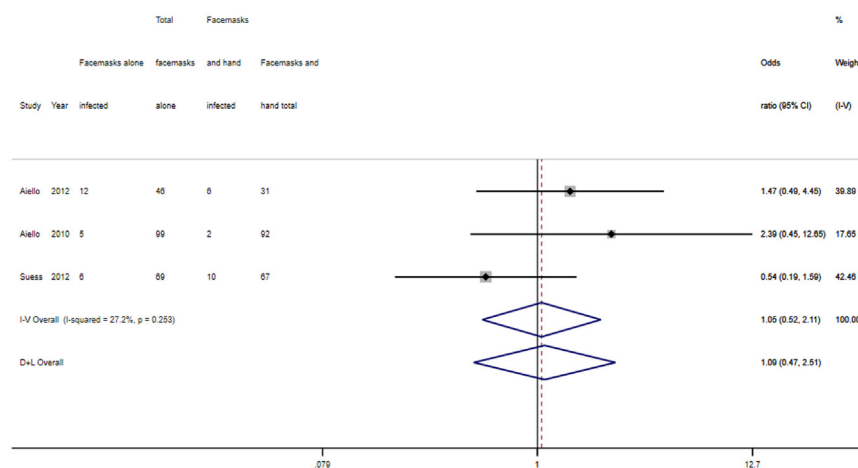


Figure 1. Forest plots of the risk of respiratory infection transmission comparing (A) Facemasks use alone vs. controls in laboratory-confirmed influenza, (B) Facemasks use alone vs. controls in influenza-like illness, (C) Facemasks use alone vs. facemasks use and handwashing combined in laboratory-confirmed influenza.

Conflict of interest

No conflict of interest to declare.

Funding

None.

Ethical approval

Approval was not required.

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